HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, Colorado

Foose State A17-647 Production

Job Date: Saturday, November 11, 2023

Sincerely,

Meghan Van Zyl

Legal Notice

Disclaimer:

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Foose State A17-647 – Production**. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Job was pumped per design with an average cement density of 13.19 ppg at 7.10 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 381 bbl. of treated freshwater displacement. Plug was landed at 2,500 psi and pressured up to 3,000 psi. Approximately 65 bbl. of spacer was returned to surface indicating a top of cement around 1011'.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

Halliburton Rockies Cement Team

1.2 Job Overview

Job Details	
API #:	05-123-52160
City, County:	Kersey, Weld
SO#:	908973720

Job Times		
	Date (mm/dd/yyyy)	**Time (hh:mm)**
Requested Time On Location:	11/11/2023	8:30
Called Out Time:	11/11/2023	2:30
Arrived On Location:	11/11/2023	8:00
Job Started:	11/11/2023	11:56
Job Completed:	11/11/2023	16:32
Departed Location:	11/11/2023	18:00

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	50
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.6
4	Casing set depth (shoe)	ft	17328
5	TVD	ft	6804
6	Float collar depth	ft	17321
7	Length of rate hole	ft	13
8	Previous casing shoe depth	ft	1910
9	Pre-job mud circulation time	hh:mm	02:00
10	Pre-job mud circulation rate	bpm	10

11	Pre-job mud circulation volume	bbls	900
12	Mud circulation pressure at start of cement	psi	200
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	401
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	65 spacer
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2500
20	Number of Centralizers	-	209
21	Number of bottom plugs	-	2
22	Number of trucks used preparing/during job	-	4
23	Add hours? If Yes, put #	Y/N and hours	N
24	NPT? If Yes, put #	Y/N and hours	N

1.3 Water Field Test

	Recorded Value	Unit	Acceptable Limit	Potential Problems if Values Exceed the Limit
pH	7		6.0 - 8.0	Chemicals in water can cause severe retardation
Temperature	66	F	60 - 80 F	Can can pre-mature setting of cement
Chlorides	200	ppm	3000 ppm	Can shorten thickening time

1.4 Actual Pump Schedule

	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
Spacer Fluid	12	120	2.26	13.8	294	4114
Cap Cement	13.2	40	1.59	7.98	140	1117
Lead Cement	13.2	216	1.66	7.82	732	5724
Tail Cement	13.2	417	1.98	9.51	1184	11259
Top Plug	1					
Displacement Fluid	8.33	401				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq. No.	Activity	Date	Time	Comments
1	Call Out	11/11/2023	02:30:00	Crew called out at 0230 on 11/11/2023 for a requested-on location time of 0830 on 11/11/2023.
2	Safety Meeting	11/11/2023	06:50:00	Pre convoy safety meeting discussed route to location and hazards of driving.
3	Crew Leave Yard	11/11/2023	07:00:00	Crew Leaves yard in convoy at 0700 hrs.
4	Arrive At Loc	11/11/2023	08:00:00	Crew arrived on location at 0800 hrs. Meet with costumer TD 17342', 8.5 OH, TP 17328' 5.5' 17#, FC 17321', TVD 6804', P/C 1910' 9.625 36#, OBM WEIGHT 10.6 PPG.
5	Safety Meeting - Pre Rig-Up	11/11/2023	09:00:00	Discuss hazards around rig up area.
6	Rig-Up Completed	11/11/2023	10:15:00	Rig up completed.
7	Safety Meeting - Pre Job	11/11/2023	11:15:00	Pre job safety meeting discussed all hazards prior to job and reviewed job procedure.
8	Start Job	11/11/2023	11:56:28	Start recording data.
9	Test Lines	11/11/2023	11:59:08	Pressure tested HES lines to 6500 psi and Rig manual valve to 1800 psi both good tests.
10	Drop Bottom Plug	11/11/2023	12:17:00	1st bottom plug verified by DSR.
11	Pump Spacer 1	11/11/2023	12:18:59	Pumped 120 bbls (294 sks) of Tuned Prime Spacer @12ppg/2.29ft3/14.04gal/sack. Mix gallons was 4130 gallons. Average rate was 7bpm with 400 psi on the line.
12	Check Weight	11/11/2023	12:26:43	Weight verified by Mud scales.
13	Drop Bottom Plug	11/11/2023	12:46:31	2nd bottom plug verified by DSR.
14	Pump Cap Cement	11/11/2023	12:46:37	Pumped 40 bbls (140 sks) of EconoCem Cap cement @13.2ppg/1.59ft37.98gal/sack. Mix gallons was 1117 gallons. Average rate was 4bpm with 200 psi on the line. TOCC=1014'.

15	Check Weight	11/11/2023	12:53:36	Weight verified by mud scales.
16	Pump Lead Cement	11/11/2023	12:55:09	Pumped 216 bbls (732 sks) of ElastiCem Lead cement @13.2ppg/1.66ft3/7.82gal/sack. Mix gallons was 5724 gallons. Average rate was 8bpm with 845 psi on the line. TOLC= 1828'.
17	Check Weight	11/11/2023	13:01:46	Weight verified by Mud scales.
18	Check Weight	11/11/2023	13:10:11	Weight verified by Mud scales.
19	Pump Tail Cement	11/11/2023	13:25:42	Pumped 417 bbls (1184 sks) of NeoCem Tail cement @13.2ppg/1.98ft3/9.51gal/sack. Mix gallons was 11,259 gallons. Average rate was 8bpm with 1400 psi on the line. TOTC= 7122'.
20	Check Weight	11/11/2023	13:29:05	Weight verified by mud scales.
21	Check Weight	11/11/2023	13:33:18	Weight verified by mud scales.
22	Check Weight	11/11/2023	13:55:30	Weight verified by mud scales.
23	Check Weight	11/11/2023	14:01:05	Weight verified by mud scales.
24	Shutdown	11/11/2023	14:28:00	Shutdown to wash up pumps and lines with 20 bbls of water.
25	Drop Top Plug	11/11/2023	14:46:40	Top plug verified by DSR.
26	Pump Displacement	11/11/2023	14:46:45	Pumped 401 bbls of freshwater displacement with 10 gallons of MMCR in first 20 bbls. MC MX 820-6 & bellacide 300w threw out the rest of displacement.
27	Bump Plug	11/11/2023	15:42:56	FCP @2bpm was 2500 psi bumped up to 3000 psi.
28	Other	11/11/2023	15:48:00	6 bbls back to pump truck floats holding.
29	Other	11/11/2023	16:00:05	No clear rupture highest pressure was 2630 psi, pumped additional 4 bbls.
30	Other	11/11/2023	16:02:15	4.5 bbls back to pump truck Floats holding, begin in flow test.
31	End Job	11/11/2023	16:32:02	.5 bbl gained after 30 minutes. stop recording data. Washed rig stack with 15 bbls of freshwater.
32	Safety Meeting - Pre Rig-Down	11/11/2023	17:00:00	Discuss blow down and any new hazards that could have come up during job.
33	Rig-Down Completed	11/11/2023	17:50:00	Rig down completed.

34	Pre-Convoy Safety Meeting	11/11/2023	17:55:00	Fit for duty check and check road conditions.
35	Crew Leave Location	11/11/2023	18:00:00	Crew departs location. Thank you for using Halliburton.

3.0 Attachments

3.1 Real Time iCem Job Chart